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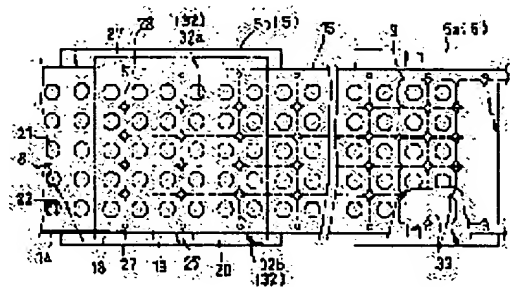
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(54) BLISTER PACKAGING MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To simply and surely eliminate the point of corners of a cutoff piece which is individually cut off, and in addition, facilitate a modification from an already existing equipment, and perform the modification at a low cost.

SOLUTION: In this packaging machine, a forming means which forms recesses 21 on a resin sheet 8, a filling means for articles to be packaged, which houses articles 22 to be packaged in the recesses 21, a sealing means which affixes a seal sheet 14 to the resin sheet 8, a cutting means 5 which forms a perforation 32 between the formed recesses 21... on the stock roll sheet 15, and a punching means 6 which punches out a blister package 9 of a specified shape from the stock roll sheet 15, are provided. Then, a drilling means which forms a positioning hole 27 on the stock roll sheet 15, is provided, and the perforation 32 is formed at a specified location to the positioning hole 27. By using the positioning hole 27, the stock roll sheet 15 on which the perforations 32 are formed, is positioned at a specified location of the punching means 6.



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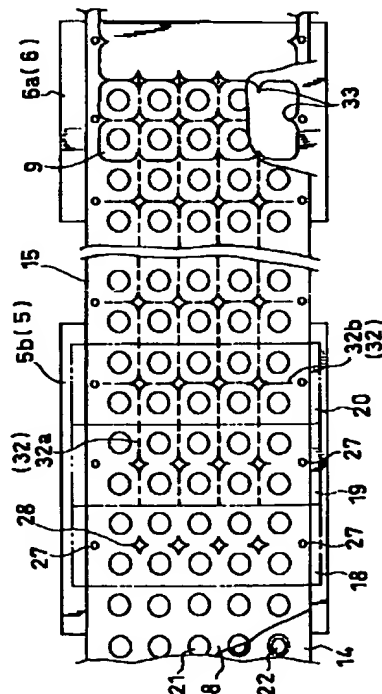
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(54) 【発明の名称】 プリスター包装機

(57) 【要約】

【課題】 個々に切り離された切離片の隅部の尖りを簡単に且つ確実に無くし、しかも既存の設備から容易に改造でき、安価に実施できるようにする。

【解決手段】 樹脂シート(8)に凹部(21)を形成する成形手段と、この凹部(21)に被包装物(22)を収容する被包装物充填手段と、この樹脂シート(8)にシールシート(14)を貼合わせる封止手段と、形成された原反シート(15)の凹部(21...)間にミシン線(32)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを設ける。原反シート(15)に位置決め穴(27)を形成する穴あけ手段(25)を設け、この位置決め穴(27)に対する所定位置にミシン線(32)を形成する。この位置決め穴(27)を用いて上記ミシン線(32)の形成された原反シート(15)を打抜手段(6)の所定位置へ位置決めする。



【特許請求の範囲】

【請求項1】 樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合させて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21...)間にミシン線(32)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、
上記原反シート(15)に位置決め穴(27)を形成する穴あけ手段(25)を設けて、この位置決め穴(27)に対する所定位置に上記ミシン線(32)を形成可能に構成し、
この位置決め穴(27)を用いて上記ミシン線(32)の形成された原反シート(15)を上記打抜手段(6)の所定位置へ位置決め可能に構成したことを特徴とする、プリスター包装機。

【請求項2】 上記穴あけ手段(25)を上記切込手段(5)に設けた、請求項1に記載のプリスター包装機。

【請求項3】 樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合させて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21...)間へ原反シート(15)の送り方向と幅方向とにそれぞれミシン線(32a・32b)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、
上記切込手段(5)に星形打抜手段(26)を設けて、上記両ミシン線(32a・32b)の交差部に四稜星状の星形部(28)を打抜き可能に構成し、

上記原反シート(15)に位置決め穴(27)を形成する穴あけ手段(25)を設けて、この位置決め穴(27)により上記両ミシン線(32a・32b)の交差部と星形部(28)とを位置合せ可能に構成したことを特徴とする、プリスター包装機。

【請求項4】 上記切込手段(5)を、上面にミシン刃(23)を設けた下型(5a)とその上方に固定配置した上型(5b)とから構成し、

上記星形打抜手段(26)を星形打抜金型(26a)と星形ポンチ(26b)とから構成して、この星形打抜金型(26a)を上記下型(5a)の上面に固定するとともにこの星形打抜金型(26a)に対向させて上記星形ポンチ(26b)を上記上型(5b)に付設し、

上記下型(5a)を昇降させることにより、上記ミシン刃(23)と星形打抜金型(26a)とを移動させて、前記原反シート(15)の所定位置にミシン線(32a・32b)と星形部(28)とを形成可能に構成した、請求項3に記載のプリスター包装機。

【請求項5】 上記穴あけ手段(25)を上記切込手段(5)に設けた、請求項3または請求項4に記載のプリスター包装機。

【請求項6】 樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合させて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21...)間にミシン線(32)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、

上記切込手段(5)に星形打抜手段(26)を設けて、上記原反シート(15)に四稜星状の星形部(28)を打抜き可能に構成し、

この星形打抜手段(26)と上記ミシン線(32)を形成するミシン刃(23)とを直列状に配置して、このミシン線(32)と上記星形部(28)とを同時形成可能に構成したことを特徴とする、プリスター包装機。

【請求項7】 上記切込手段(5)を、上面に上記ミシン刃(23)を固定した下型(5a)とその上方に固定配置した上型(5b)とから構成し、

上記星形打抜手段(26)を星形打抜金型(26a)と星形ポンチ(26b)とから構成して、この星形打抜金型(26a)を上記ミシン刃(23)と直列状に配置し、

この星形打抜金型(26a)に対向させて上記星形ポンチ(26b)を上記上型(5b)に付設し、

上記下型(5a)を昇降させることにより上記ミシン刃(23)と星形打抜金型(26a)とを移動させて、前記原反シート(15)の所定位置にミシン線(32)と星形部(28)とを同時形成可能に構成した、請求項6に記載のプリスター包装機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、錠剤やカプセルなどの被包装物を所定数量ごとに切離可能に包装するプリスター包装機に関し、さらに詳しくは、個々に切り離された切離片の隅部の尖りを簡単に且つ確実に無くせ、しかも既存の設備から容易に改造でき、安価に実施できるプリスター包装機に関する。

【0002】

【発明の背景】プリスター包装は、合成樹脂製の樹脂シートに多数の凹部を形成して各凹部に被包装物を収容したのち、アルミ箔などのシールシートを貼り合わせて各凹部を密封してあり、被包装物を所定数量ずつ個別に包装してあるうえ、コンパクトで携帯性に優れ、見栄えもよく使用時に取り出しやすい等の利点があることから、医薬品や食品、雑貨などの包装に広く使用されている。

【0003】上記プリスター包装には、各凹部間にミシン線などの切離線を縦横に形成して所定数量ごとに切離し可能に形成したものがあるが、錠剤やカプセルなど小形の被包装物を1凹部ごとに切り離した場合、この切離片をそのまま、即ちプリスター包装ごと誤って飲み下してしまった事故があった。上記プリスター包装は縦横の

切離線で切り離されるため個々の切離片は隅部が直角に尖っており、プリスター包装ごと誤飲されるとこの隅部が突き刺さって食道や胃等を損傷させることがあり、外科的な処置が必要となった事例も報告されている。また上記切離片の隅部が尖っていることから、この切離片を雑に取り扱うと指先を傷つける虞れもある。このため、この尖り部を無くする手段の開発が急がれている。

【0004】

【従来技術】一般にこの種のプリスター包装機は、例えば図10に示すように、樹脂シート(51)に凹部を形成する成形手段(52)と、この凹部に錠剤等の被包装物を供給して収容する被包装物充填手段(53)と、この凹部の開口を封止する状態にシールシート(54)を貼合させて原反シート(55)に形成する封止手段(56)と、この原反シート(55)の上記凹部間にミシン線を形成する切込手段(57)と、原反シート(55)から所定形状のプリスター包装(58)を打ち抜く打抜手段(59)とを備えている。そして、上記切離片の隅部に丸みを持たせるためのプリスター包装機としては、例えば実公昭61-31930号公報に開示のものがある。即ち、この従来技術では、例えば図11に示すように、打抜手段(59)の打抜金型(60)の周縁に内方へ突出する凸部(61)を形成してあり、上記切込手段(57)で形成したミシン線(62)の端部に相当する位置に切欠部(63)が形成されるように構成してある。

【0005】

【発明が解決しようとする課題】上記従来のプリスター包装機では、次の問題があった。

(1)例えば図12に示すように、上記ミシン線(62)と切欠部(63)の相対位置がずれるとプリスター包装(58)から切り離した切離片(64)の隅部に尖った形状が形成された不良品となるので、このような不良品を生じないように両者の位置を精確に一致させる必要がある。しかしながら、原反シートは樹脂シートが形成手段や封止手段で加熱・冷却されることもあって寸法精度が低く、このため切込手段で形成したミシン線と打抜手段で形成する切欠部との位置合せは容易でない。

【0006】(2)プリスター包装に縦方向と横方向のミシン線を形成する場合は、両ミシン線の交差部が直角となるため、このミシン線を切り離した切離片の隅部に尖った形状が形成される。

【0007】(3)上記切込手段で縦横のミシン線を形成する場合、両ミシン線の交差部に四稜星状の星形部を形成することも考えられるが、この星形部を形成するための星形打抜工程を新たに付加すると、プリスター包装機全体が大型化する問題があるうえ、既存の設備に容易に組み込むことができない問題がある。また、星形の打抜き片の確実な排除が容易でなくこの排除のための高価な設備が必要なうえ、両ミシン線と星形部との位置合せも容易ではないため、これらの位置検出手段や位置調整手段も必要となり、安価に実施することができな

い。

【0008】本発明は上記問題点を解消して、個々に切り離された切離片の隅部の尖りを簡単に且つ確実に無くせ、しかも既存の設備から容易に改造でき、安価に実施できるプリスター包装機を提供することを技術的課題とする。

【0009】

【課題を解決するための手段】本発明は上記課題を解決するために、例えば、本発明の実施の形態を示す図1から図8に基づいて説明すると、プリスター包装機を次のように構成したものである。即ち本発明1は、樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合させて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21)間にミシン線(32)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、上記原反シート(15)に位置決め穴(27)を形成する穴あけ手段(25)を設けて、この位置決め穴(27)に対する所定位置に上記ミシン線(32)を形成可能に構成し、この位置決め穴(27)を用いて上記ミシン線(32)の形成された原反シート(15)を上記打抜手段(6)の所定位置へ位置決め可能に構成したことを特徴とする。

【0010】ここで、本発明にいう被包装物は、医薬品、食品、農薬等の、錠剤やカプセルなどの一定形状を有する固形物はもとより、所定量に計量した粉末や液体、流動体などであってもよい。なお、本発明1にいう上記切込手段は、少なくとも1方向にミシン線を設けるものであればよく、勿論、原反シートの送り方向と幅方向の両方に設けるものであってもよい。また、上記位置決め穴に対する所定位置にミシン線を形成する構成とは、例えばミシン線を形成する直前に位置決め穴へパイロットピン等を挿通して位置決めするように構成してもよく、また、位置決め穴とミシン線とを同時に形成するように構成してもよい。

【0011】本発明2は、樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合させて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21)間へ原反シート(15)の送り方向と幅方向とにそれぞれミシン線(32a・32b)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、上記切込手段(5)に星形打抜手段(26)を設けて、上記両ミシン線(32a・32b)の交差部に四稜星状の星形部(28)を打抜き可能に構成し、上記原反シート(15)に位置決め穴(27)を形成する穴あけ手段(25)を設けて、この位置決め穴(27)により上記両ミシン線(32a・32b)の交差部と

星形部(28)とを位置合せ可能に構成したことを特徴とする。

【0012】上記本発明1や本発明2という穴あけ手段は切込手段に設けてもよく、この場合には、例えば封止手段と切込手段との中間部等の他の部位に設ける場合に比べて新たな工程を追加する必要がなく、設備が大型化せずまた既存設備からの改造も容易であるのでより好ましい。なお、上記穴あけ手段による位置決め穴は、原反シート

のいずれの部位に形成してもよいが、例えば側縁近傍など、所定形状のプリスター包装が打抜かれた残部の不要部分に形成するのが好ましい。

【0013】また本発明3は、樹脂シート(8)に凹部(21)を形成する成形手段(2)と、この凹部(21)に被包装物(22)を供給して収容する被包装物充填手段(3)と、この凹部(21)の開口を封止する状態にシールシート(14)を貼合わせて原反シート(15)に形成する封止手段(4)と、この原反シート(15)の上記凹部(21...)間にミシン線(32)を形成する切込手段(5)と、原反シート(15)から所定形状のプリスター包装(9)を打ち抜く打抜手段(6)とを備え、上記切込手段(5)に星形打抜手段(26)を設けて、上記原反シート(15)に四稜星状の星形部(28)を打抜き可能に構成し、この星形打抜手段(26)と上記ミシン線(32)を形成するミシン刃(23)とを直列状に配置して、このミシン線(32)と上記星形部(28)とを同時形成可能に構成したことを特徴とする。

【0014】

【作用】本発明1では、位置決め穴に対する所定位置にミシン線が形成され、この位置決め穴を用いて原反シートが打抜手段の所定位置へ位置決めされるので、打抜手段で打抜かれるプリスター包装の外形と切込手段で形成されたミシン線との相対位置が、原反シートの寸法精度にかかわらず、上記位置決め穴を介して精確に位置決めされる。

【0015】本発明2では、星形打抜手段による星形部と切込手段によるミシン線との相対位置が、原反シートの寸法精度にかかわらず、穴あけ手段で形成された位置決め穴を介して精確に位置決めされる。

【0016】本発明3では、星形部がミシン線と直列状に同時形成されるので、このミシン線と星形部とは位置ずれを生じることがない。なお、上記ミシン線は原反シートの送り方向と幅方向とのいずれのミシン線であってもよい。この幅方向のミシン線を星形部と直列状に同時形成する場合、原反シートの送り方向のミシン線に対しては、例えば原反シートの側縁部等を用いて位置決めしてもよいが、上記本発明1や本発明2の位置決め穴を用いるのが高精度に位置決めするうえでより好ましい。

【0017】上記本発明2や本発明3における星形打抜手段としては、星形打抜金型とこれに対向して配置する星形ボンチとから構成することができる。一般に、打抜金型とボンチとからなる打抜手段は、打抜金型の上面に

加工対象シートを固定し、この打抜金型に向けてボンチを進退駆動することにより所定の形状が打抜かれる。

【0018】一方、プリスター包装の原反シートは、被包装物を凹部に収容した樹脂シートの上面にシールシートが貼り合わされており、この原反シートにミシン線を形成するには、切込手段においてミシン刃を原反シートの下方に配置し、このミシン刃を昇降させる必要がある。そこで上記本発明における切込手段に設けた星形打抜手段は、上記進退駆動される星形ボンチをミシン刃とともに原反シートの下方に配置し、これらを昇降駆動することによりミシン線と星形部とをそれぞれ形成可能に構成することも考えられる。しかしこの場合は打抜き片が押し込まれる星形打抜金型が上方に位置するため打抜き片が金型から落下し易く、装置からの排除が困難である。そしてこの打抜き片を確実に吸引排除する等の適切な処置を講じないと、この打抜き片が星形打抜金型から落下して原反シート上や他の装置上に散乱し、不良品を生じたり製品となるプリスター包装に混入したりする虞れがあり、また、装置に各種障害を生じて運転が停止してしまう虞れもある。

【0019】そこで、上記本発明2や本発明3において、上記切込手段を、上面にミシン刃を設けた下型とその上方に固定配置した上型とから構成し、上記星形打抜手段を星形打抜金型と星形ボンチとから構成して、この星形打抜金型を上記下型の上面に固定するとともにこの星形打抜金型に対向させて上記星形ボンチを上記上型に付設し、上記下型を昇降させることにより、上記ミシン刃と星形打抜金型とを移動させて、前記原反シートの所定位置にミシン線と星形部とを形成可能に構成した場合には、下型を移動させるだけでミシン線と星形部とが形成されるうえ、星形部の形成に際して生じる打抜き片が下方に位置する星形打抜金型に押し込まれるので、この星形打抜金型内を通して確実に排除される。

【0020】

【実施の形態】以下、本発明の実施の形態を図面に基づき説明する。図1から図4は本発明の第1実施形態を示し、図1はプリスター包装機の概略構成図、図2は切込手段の断面図、図3は切込手段の下型の斜視図、図4は原反シートの加工順序の説明図である。

【0021】図1に示すように、このプリスター包装機(1)は、成形手段(2)、被包装物充填手段(3)、封止手段(4)、切込手段(5)及び打抜手段(6)を備え、樹脂シート供給ロール(7)から供給される樹脂シート(8)を順に通過させて所定形状のプリスター包装(9)を得るように構成してある。即ち、樹脂シート供給ロール(7)から供給される樹脂シート(8)は加熱部(10)を通過して予熱され、上記成形手段(2)で所定形状の凹部を形成したのち、被包装物充填手段(3)で被包装物である錠剤がホッパー(12)からこの凹部に供給され収容される。次いでシールシート供給ロール(13)から供給されるシールシート

(14)が上記封止手段(4)で上記樹脂シート(8)に貼り合わされ、上記凹部の開口が封止されて錠剤が密封される。この貼り合わせにより形成された原反シート(15)は、上記切込手段(5)を通過する際に上記凹部間に所定のミシン線が形成され、刻印手段(16)で所定の記号等が刻印されたのち上記打抜手段(6)へ案内され、所定形状のプリスター包装(9)が打抜かれるとともに、残部の不要部分は廃棄物収容容器(17)内へ廃棄される。

【0022】図2に示すように、上記切込手段(5)は、打抜部(18)と送り方向ミシン線形成部(19)と幅方向ミシン線形成部(20)との3工程からなる順送り加工型に構成してある。上記切込手段(5)を通過する原反シート(15)は、樹脂シート(8)に形成された凹部(21)に錠剤(22)を収容しその上にシールシート(14)を配置して密封してあるので、この樹脂シート(8)側からミシン線を形成するミシン刃(23)は切込手段(5)の下型(5a)に設けてあり、このミシン刃(23)をプレス装置(24)で昇降可能に構成してある。

【0023】上記打抜部(18)には、丸形打抜金型(25a)と穴あけポンチ(25b)とからなる穴あけ手段(25)と、星形打抜金型(26a)と星形ポンチ(26b)とからなる星形打抜手段(26)とを直列状に設けてある。図2及び図3に示すように、上記両各打抜金型(25a・26a)は、打抜き操作により生じた打抜き片が各打抜金型(25a・26a)内を落下して確実に廃棄できるように、下方に位置する上記下型(5a)に設けてあり、各打抜金型(25a・26a)にそれぞれ対向させて穴あけポンチ(25b)と星形ポンチ(26b)とを切込手段(5)の上型(5b)に固定してある。なお、打抜き片を真空吸引等により確実に排除できる場合は打抜金型を上記上型に設けてもよく、またこれらに代えて水平移動可能に配置してもよい。

【0024】前述のように、上記ミシン刃(23)を設けた下型(5a)は昇降可能に構成してあるので、この下型(5a)に設けた両打抜金型(25a・26a)を下型(5a)とともに昇降することにより、上記両打抜き操作が行なわれる。即ち、上記下型(5a)が上昇すると原反シート(15)が各打抜金型(25a・26a)で押し付けられ、上型(5b)の各ポンチ(25b・26b)の周囲に配置したブロック(34)との間に挟持される。さらに下型(5a)及び各各打抜金型(25a・26a)が上昇すると、上記ブロック(34)はゴム製の緩衝部材(30)で緩衝されながら上方へ後退し、このブロック(34)を貫通する上記穴あけポンチ(25b)及び星形ポンチ(26b)の先端が上記原反シート(15)の所定箇所に押し付けられ、図4に示すように、原反シート(15)の両側縁近傍に一对の位置決め穴(27・27)が打ち抜かれるとともに、両位置決め穴(27・27)間で且つ錠剤(22)を収容した各凹部(21)の中間に4個の四稜星状の星形部(28…)が打ち抜かれる。そしてこの打抜き操作により生じた打抜き片は真空吸引され、図2に示すように、打抜金型(25a・26a)内の排出路(29)から排出される。なお、上記緩衝部

材(30)としてこの実施形態ではゴム筒を用いているが、これに代えて金属バネ等を用いてもよい。

【0025】次いで、下型(5a)が下降し再度上昇する間に原反シート(15)が所定寸法だけ送られ、上記位置決め穴(27)と星形部(28)を形成した部分が送り方向ミシン線形成部(19)へ送り込まれる。そして、下型(5a)の上昇に伴って最初にパイロットピン(31)の先端が上記位置決め穴(27)に挿通され、これにより原反シート(15)が所定位置に位置決めされたのち、4枚のミシン刃(23a)により送り方向のミシン線(32a)が形成される。そして同様の操作が繰り返されて、幅方向のミシン刃(23b)により原反シート(15)の所定箇所に幅方向のミシン線(32b)が形成される。このとき、原反シート(15)は位置決め穴(27)を用いて位置決めされるので、上記両ミシン線(32a・32b)の交差部は前記星形部(28)を形成した位置に精確に位置決めされる。

【0026】上記切込手段(5)を通過した原反シート(15)は、上記打抜手段(6)に送込まれると、図4に示すように、打抜金型(6a)の周縁に設けた凸部(33)が上記切込手段(5)で形成されたミシン線(32)の端部に精確に位置するように、上記位置決め穴(27)を用いて位置決めされ、所定形状のプリスター包装(9)が打抜かれる。

【0027】上記第1実施形態では、原反シート(15)の送り方向にミシン線(32a)を形成したのち幅方向のミシン線(32b)を形成したが、いずれのミシン線を先に形成してもよい。また、打抜部(18)に穴あけ手段(25)と星形打抜手段(26)とを設けたが、これを2段階に形成し、穴あけ手段で位置決め穴を形成したのち星形打抜手段で星形部を形成するように構成してもよい。この場合、位置決め穴を形成した後は星形部と各ミシン線をどのような順序で形成してもよい。

【0028】図5から図7は本発明の第2実施形態を示し、図5は切込手段に設けた幅方向のミシン刃の斜視図、図6は原反シートの加工順序の説明図、図7は切込手段の部分断面図である。

【0029】この第2実施形態では、図5に示すように、原反シートの幅方向のミシン刃(23b)と星形打抜手段(26)の星形打抜金型(26a)とを直列状に配置してあり、図6に示すように、切込手段(5)では、最初に位置決め穴(27)が形成され、次いで送り方向のミシン線(32a)が形成され、最後に幅方向のミシン線(32b)と両ミシン線(32a・32b)の交差部に星形部(28)とが同時に形成される。

【0030】即ち、図7に示すように、切込手段(5)の上型(5b)には上記ミシン刃(23b)に対向させてブロック(34)が配置してあり、このブロック(34)を貫通可能に星形ポンチ(26b)が配置され、図外の駆動装置で駆動されるアランジャー(35)により傾斜カム(36)を介して下方へ押圧可能に構成してある。なお、符号(37)は星形ポンチ(26b)を上方へ押し返すための緩衝ゴム筒、符号(38)は

ミシン刃(23b)がブロック(34)に突き当たる衝撃を緩衝するための緩衝部材を示す。

【0031】切込手段(5)の下型(5a)が上昇すると、まずパイロットピン(31)の先端が原反シート(15)の位置決め穴に挿通され、原反シート(15)を所定位置に位置決めしたのちミシン刃(23b)が押し付けられて幅方向のミシン線が形成される。なお、上記星形打抜金型(26a)はミシン刃(23b)の刃先が原反シート(15)に十分くい込むようにこの刃先よりも上端を僅かに低く形成してある。このミシン線の形成とはほぼ同時に上記ブランチャー(35)が下方へ駆動され、星形ポンチ(26b)が下降して原反シート(15)を打ち抜き、星形部が形成される。そして打抜き片は星形打抜金型(26a)内を落下し、吸引されて排出路(29)から排出される。その他の構成は上記第1実施形態と同様であり、説明を省略する。

【0032】上記第2実施形態では位置決め穴を形成したのち送り方向のミシン線を形成したが、両者を同時に形成してもよく、この場合は2工程からなる順送り加工型にすることができる。また、星形打抜手段を送り方向のミシン線を形成するミシン刃と直列状に配置してもよい。また、幅方向のミシン線と星形部と位置決め穴とを同時に形成したのち送り方向のミシン線を形成してもよい。なお、原反シートの幅方向の位置合わせは、例えばシートの側縁部を用いることもできるので、幅方向のミシン線と星形部を同時に形成する場合は切込手段のみを考慮すると上記位置決め穴を省略することも可能である。

【0033】上記実施形態ではいずれもプリスター包装の切離片に円弧状の隅部が形成される場合について説明したが、本発明の星形部は尖っていなければ他の形状であってもよい。例えば図8に示す第1変形例では、星形部(28)を菱形に形成したものである。この場合、プリスター包装(9)の切離片(39)の隅部は角張るものの、従来の直角となる場合に比べて尖った形状とならない。

【0034】また、上記実施形態ではいずれも切離片(39)からのみなるプリスター包装(9)を製造する場合について説明したが、本発明のプリスター包装機は、例えば図9に示す第2変形例のように、端縁に耳部(40)を有するプリスター包装(9)にも適用できることは言うまでもない。

【0035】なお、上記実施形態では位置決め穴を形成する穴あけ手段を切込手段に設けたが、切込手段を含めこれよりも上流側であればいずれの位置に設けてもよい。また、上記実施形態では錠剤を包装する場合について説明したが、本発明のプリスター包装機で包装できる被包装物はカプセルなど他の形状の被包装物や医薬品以外の被包装物であってもよいことは言うまでもない。

【0036】

【発明の効果】本発明は上記のように構成され作用することから、次の効果を奏する。

【0037】(イ)本発明1では、穴あけ手段が形成する位置決め穴を介して、切込手段で形成されたミシン線と打抜手段で打抜かれるプリスター包装の外形との相対位置が、原反シートの寸法精度にかかわらず精確に位置決めされるので、上記ミシン線の端部とプリスター包装の外周に形成される切欠部との位置を精確に合せることにより、個々に切り離された切離片の隅部の尖りを簡単に且つ確実に無くすることができる。このため、たとえ誤飲事故があっても切離片で食道や胃部を傷つける虞れがなく、また切離片を雑に扱っても指先などを傷つける虞れがない。

【0038】(ロ)本発明2では、穴あけ手段で形成された位置決め穴を介して、星形打抜手段による星形部と切込手段によるミシン線との相対位置を、原反シートの寸法精度にかかわらず精確に位置決めすることができ、個々に切り離された切離片の隅部の尖りを簡単に且つ確実に無くすることができる。このため、たとえ誤飲事故があっても切離片で食道や胃部を傷つける虞れがなく、また切離片を雑に扱っても指先などを傷つける虞れがない。しかも、星形打抜手段は切込手段に設けてあるので、星形部を形成するための新たな工程を追加する必要がなく、設備が大型化せずまた既存設備から容易に改造できるので安価に実施することができる。

【0039】(ハ)上記本発明1や本発明2において穴あけ手段を切込手段に設けた場合には、封止手段と切込手段との中間部に設ける場合に比べて位置決め穴を形成するための新たな工程を追加する必要がなく、設備が大型化せずまた既存設備からの改造も容易であるので一層安価に実施することができる。

【0040】(ニ)本発明3では、星形部がミシン線と直列状に同時形成されるので、このミシン線と星形部とは位置ずれを生じる虞れがなく、個々に切り離された切離片の隅部の尖りを一層確実に無くすることができる。しかも、星形打抜手段をミシン刃と直列状に配置してあるので、切込手段を大型化することなく星形打抜手段を設けることができるうえ、既存設備から容易に改造でき、安価に実施することができる。

【0041】(ホ)本発明2や本発明3において、切込手段を、上面にミシン刃を設けた下型とその上方に固定配置した上型とから構成し、上記星形打抜手段を星形打抜金型と星形ポンチとから構成して、この星形打抜金型を上記下型の上面に固定するとともにこの星形打抜金型に対向させて上記星形ポンチを上記上型に付設し、上記下型を昇降させることにより、上記ミシン刃と星形打抜金型とを移動させて、前記原反シートの所定位置にミシン線と星形部とを形成可能に構成した場合には、下型を移動させるだけの構成でミシン線と星形部とを簡単に形成できるうえ、星形部の形成に際して生じる打抜き片を、下方に位置する星形打抜金型内を通して確実に排除することができ、打抜き片が原反シート上や他の装置上に散

乱して不良品を生じたり製品となるプリスター包装に入れたりする虞れがない。

【図面の簡単な説明】

【図1】本発明の第1実施形態を示す、プリスター包装機の概略構成図である。

【図2】第1実施形態の、切込手段の断面図である。

【図3】第1実施形態の、切込手段の下型の斜視図である。

【図4】第1実施形態の、原反シートの加工順序の説明図である。

【図5】第2実施形態の、切込手段に設けた幅方向のミシン刃の斜視図である。

【図6】第2実施形態の、原反シートの加工順序の説明図である。

【図7】第2実施形態の、切込手段の部分断面図である。

【図8】本発明の第1変形例を示す、プリスター包装の部分拡大図である。

【図9】本発明の第2変形例を示す、打抜手段におけるプリスター包装の部分拡大図である。

【図10】従来技術を示す、図1相当図である。

【図11】従来技術を示す、打抜手段の平面図である。

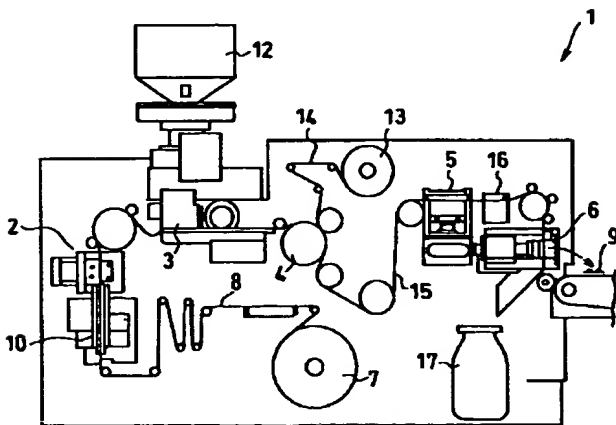
【図12】従来技術を示す、プリスター包装の部分拡大

図である。

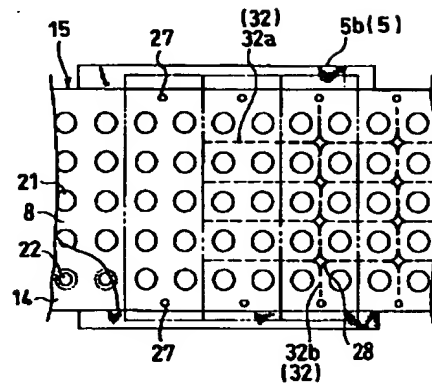
【符号の説明】

- 1…プリスター包装機、
- 2…成形手段、
- 3…被包装物充填手段、
- 4…封止手段、
- 5…切込手段、
- 6…打抜手段、
- 8…樹脂シート、
- 9…プリスター包装、
- 14…シールシート、
- 15…原反シート、
- 21…凹部、
- 22…被包装物(錠剤)、
- 23…ミシン刃、
- 25…穴あけ手段、
- 26…星形打抜手段、
- 27…位置決め穴、
- 28…星形部、
- 32…ミシン線、
- 32a…送り方向のミシン線、
- 32b…幅方向のミシン線。

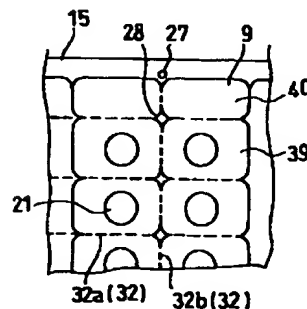
【図1】



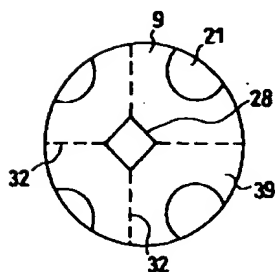
【図6】



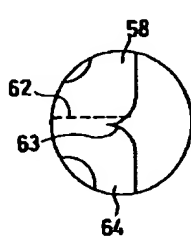
【図9】



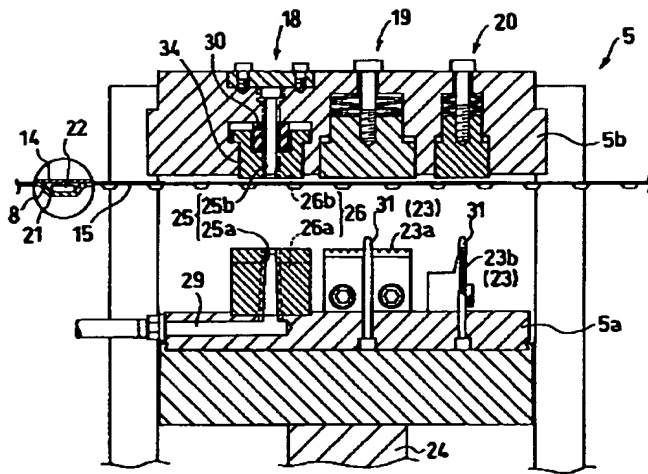
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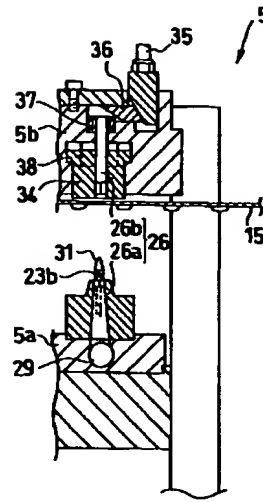
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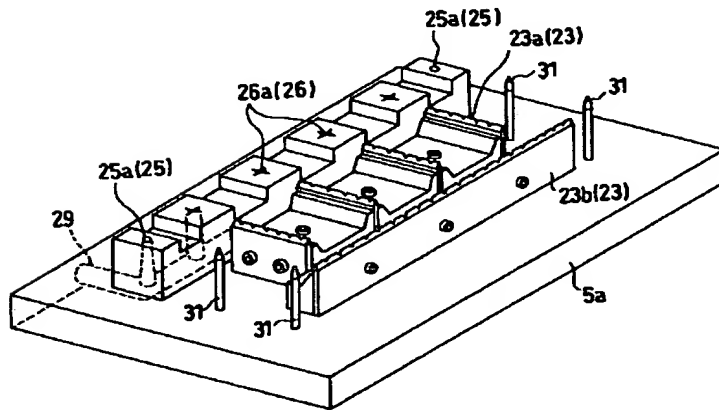
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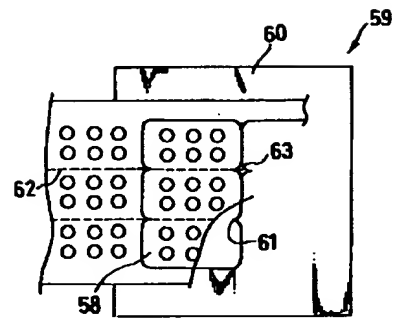
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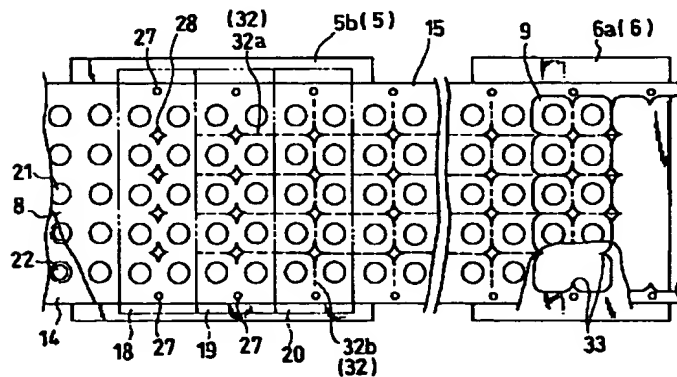
【図3】



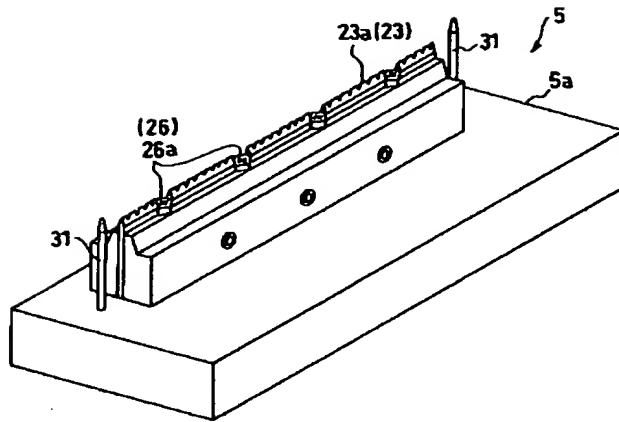
【図11】



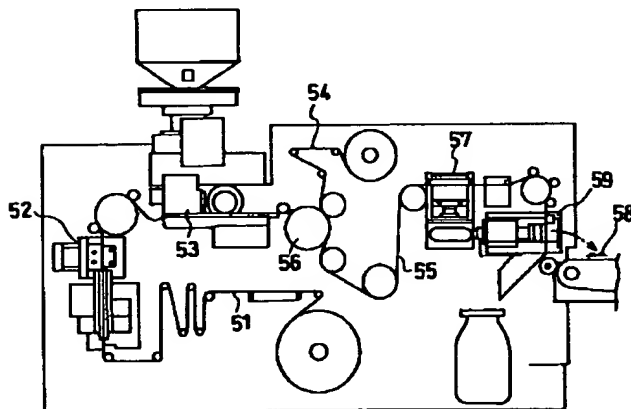
【図4】



【図5】



【図10】



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CLAIMS

[Claim(s)]

[Claim 1] Have the following and a punching means (25) to form a locating hole (27) in the above-mentioned original fabric sheet (15) is established. It constitutes possible [formation of the above-mentioned sewing-machine line (32)] in the predetermined position to this locating hole (27). The blister packaging machine characterized by constituting the original fabric sheet (15) with which the above-mentioned sewing-machine line (32) was formed using this locating hole (27) possible [positioning] to the predetermined position of the above-mentioned punched-out means (6). A forming means to form a crevice (21) in a resin sheet (8) (2) A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3) A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4) A cut means (5) to form a sewing-machine line (32) between the above-mentioned crevices (21 --) of this original fabric sheet (15), and the punched-out means which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15) (6)

[Claim 2] The blister packaging machine according to claim 1 which prepared the above-mentioned punching means (25) in the above-mentioned cut means (5).

[Claim 3] Have the following and a star punched-out means (26) is prepared in the above-mentioned cut means (5). The 4 ****-like star section (28) is constituted possible [blanking] in the intersection of both the above-mentioned sewing-machines line (32aand32b). The blister packaging machine which establishes a punching means (25) to form a locating hole (27) in the above-mentioned original fabric sheet (15), and is characterized by constituting the intersection and the star section (28) of both the above-mentioned sewing-machines line (32aand32b) possible [alignment] with this locating hole (27). A forming means to form a crevice (21) in a resin sheet (8) (2) A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3) A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4) A cut means (5) to form a sewing-machine line (32aand32b) in between the above-mentioned crevices (21 --) of this original fabric sheet (15) crosswise [of an original fabric sheet (15) / the feed direction and crosswise], respectively, and the punched-out means which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15) (6)

[Claim 4] It constitutes from metal mold (26a) and star punch (26b). from the punch (5b) which has placed in a fixed position the above-mentioned cut means (5) to the female mold (5a) which formed the sewing-machine edge (23) in the upper surface, and its upper part -- constituting -- the above-mentioned star punched-out means (26) -- star punched-out -- this star punched-out -- while fixing metal mold (26a) to the upper surface of the above-mentioned female mold (5a) -- this star punched-out -- by making metal mold (26a) counter, attaching the above-mentioned star punch (26b) to the above-mentioned punch (5b), and making it go up and down the above-mentioned female mold (5a) the above-mentioned sewing-machine edge (23) and star punched-out -- the blister packaging machine according to claim 3 which was made to move metal mold (26a) and constituted a sewing-machine line (32aand32b) and the star section (28) possible [formation] in the predetermined position of the aforementioned original fabric sheet (15)

[Claim 5] The blister packaging machine according to claim 3 or 4 which prepared the above-mentioned punching means (25) in the above-mentioned cut means (5).

[Claim 6] Have the following and a star punched-out means (26) is prepared in the above-mentioned cut means (5). Constitute the 4 ****-like star section (28) possible [blanking] on the above-mentioned original fabric sheet (15), and the sewing-machine edge (23) which forms this star punched-out means (26) and the above-mentioned sewing-machine line (32) is arranged in the shape of a serial. The blister packaging machine characterized by constituting possible

[simultaneous formation of this sewing-machine line (32) and the above-mentioned star section (28)]. A forming means to form a crevice (21) in a resin sheet (8) (2) A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3) A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4) A cut means (5) to form a sewing-machine line (32) between the above-mentioned crevices (21 --) of this original fabric sheet (15), and the punched-out means which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15) (6)

[Claim 7] The above-mentioned cut means (5) is constituted from female mold (5a) which fixed the above-mentioned sewing-machine edge (23) to the upper surface, and a punch (5b) placed in a fixed position to the upper part. It constitutes from metal mold (26a) and star punch (26b). the above-mentioned star punched-out means (26) -- star punched-out -- Metal mold (26a) is arranged the above-mentioned sewing-machine edge (23) and in the shape of a serial. this star punched-out -- Make metal mold (26a) counter and the above-mentioned star punch (26b) is attached to the above-mentioned punch (5b). this star punched-out -- you make it go up and down the above-mentioned female mold (5a) -- the above-mentioned sewing-machine edge (23) and star punched-out -- the blister packaging machine according to claim 6 which was made to move metal mold (26a) and constituted a sewing-machine line (32) and the star section (28) possible [simultaneous formation] in the predetermined position of the aforementioned original fabric sheet (15)

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] About the blister packaging machine which packs packaging goods-ed, such as a tablet and a capsule, possible [separation] for every amount of predetermined numbers, in more detail, this invention can lose simply and certainly the kurtosis of the corner of the piece of separation separated separately, moreover, can be easily converted from the existing facility and relates to the blister packaging machine which can be carried out cheaply.

[0002]

[Background of the Invention] After blister packing forming many crevices in the resin sheet made of synthetic resin and holding packaging goods-ed in each crevice, Stick seal sheets, such as aluminum foil, and each crevice is sealed. In having packed packaging goods-ed according to the amount [every] individual of predetermined numbers, it is compact and excels in portability, and since there is an advantage, such as being easy to take out appearance well at the time of use, it is widely used for packing of a drug, food, miscellaneous goods, etc.

[0003] Although there were some which formed separation lines, such as a sewing-machine line, in all directions, and formed them possible [isolation] for every amount of predetermined numbers between each crevice in the above-mentioned blister packing, when small packaging goods-ed, such as a tablet and a capsule, were separated for every crevice, there was accident which has choked down this piece of separation accidentally whole remaining as it is, i.e., blister packing. Since the above-mentioned blister packing is separated by the separation line in every direction, the example for which, as for each piece of separation, surgical disposal is needed by piercing this corner if the corner is sharp right-angled and is drunk by mistake the whole blister packing, and damaging an esophagus, the stomach, etc. is also reported. Moreover, since the corner of the above-mentioned piece of separation is sharp, when this piece of separation is dealt with coarsely, there is also a possibility of damaging a fingertip. For this reason, development of a means to lose this kurtosis section is hurried.

[0004]

[Description of the Prior Art] Generally this kind of blister packaging machine For example, a forming means to form a crevice in a resin sheet (51) as shown in drawing 10 (52), A packaging-goods-ed restoration means to supply and hold packaging goods-ed, such as a tablet, in this crevice (53), A closure means to form a seal sheet (54) in the state of closing opening of this crevice at a lamination ***** sheet (55) (56), It has a cut means (57) to form a sewing-machine line between the above-mentioned crevices of this original fabric sheet (55), and the punched-out means (59) which pierces blister packing (58) of a predetermined configuration from an original fabric sheet (55). And as a blister packaging machine for giving a radius of circle, there is a thing of an indication in the corner of the above-mentioned piece of separation at JP,61-31930,Y, for example. that is, this conventional technology shows, for example to drawing 11 -- as -- punched-out [of a punched-out means (59)] -- the heights (61) which project to the inner direction are formed in the periphery of metal mold (60), and it constitutes so that a notch (63) may be formed in the position equivalent to the edge of the sewing-machine line (62) formed with the above-mentioned cut means (57)

[0005]

[Problem(s) to be Solved by the Invention] There was the following problem in the above-mentioned conventional blister packaging machine.

- (1) For example, since it will become the defective in which the configuration where it sharpened in the corner of the

piece of separation (64) detached from blister packing (58) was formed if the relative position of the above-mentioned sewing-machine line (62) and a notch (63) shifts as shown in drawing 12, it is necessary to make both position in agreement precisely so that such a defective may not be produced. However, since a resin sheet is heated and cooled with means forming or a closure means, an original fabric sheet has a low dimensional accuracy, and alignment with the sewing-machine line which was formed with the cut means for this reason, and the notch formed with a punched-out means is not easy.

[0006] (2) since the intersection of both the sewing-machines line becomes right-angled when forming the sewing-machine line of lengthwise and a longitudinal direction in blister packing -- this sewing-machine line -- separation -- the configuration where it sharpened in the corner of the piece of separation the bottom is formed

[0007] (3) Although forming the 4 ****-like star section in the intersection of both the sewing-machines line is also considered when forming a sewing-machine line in every direction with the above-mentioned cut means, when newly adding the star punched-out process for forming this star section, in there being a problem which the whole blister packaging machine enlarges, there is a problem which is not easily incorporable into the existing facility. Moreover, it is not easy, and a top [need / to be furnished / for this exclusion / expensive], since alignment with both the sewing-machines line and the star section is not easy, either, these position detection meanses and justification meanses are also needed, and positive exclusion of the piece of blanking of a star cannot carry out cheaply.

[0008] this invention cancels the above-mentioned trouble, and the kurtosis of the corner of the piece of separation separated separately can be lost simply and certainly, and, moreover, it can convert easily from the existing facility, and let it be a technical technical problem to offer the blister packaging machine which can be carried out cheaply.

[0009]

[Means for Solving the Problem] If this invention is explained based on drawing 8 from drawing 1 which shows the gestalt of operation of this invention in order to solve the above-mentioned technical problem for example, it constitutes a blister packaging machine as follows. Namely, a forming means by which this invention 1 forms a crevice (21) in a resin sheet (8) (2), A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3), A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4), A cut means to form a sewing-machine line (32) between the above-mentioned crevices (21 --) of this original fabric sheet (15) (5), It has the punched-out means (6) which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15). A punching means (25) to form a locating hole (27) in the above-mentioned original fabric sheet (15) is established. It is characterized by having constituted possible [formation of the above-mentioned sewing-machine line (32)] in the predetermined position to this locating hole (27), and constituting the original fabric sheet (15) with which the above-mentioned sewing-machine line (32) was formed using this locating hole (27) possible [positioning] to the predetermined position of the above-mentioned punched-out means (6).

[0010] The solids with which the packaging goods-ed said to this invention have the fixed configuration of tablets, such as a drug, food, and agricultural chemicals, a capsule, etc. here may be the powder measured to the specified quantity, a liquid, a fluid, etc. from the first. In addition, of course, you may prepare the above-mentioned cut means said to this invention 1 in both the feed direction of an original fabric sheet, and the cross direction that what is necessary is just what forms a sewing-machine line in the at least 1 direction. Moreover, with the composition which forms a sewing-machine line in the predetermined position to the above-mentioned locating hole, it may constitute so that a pilot pin etc. may be inserted in and positioned to a locating hole, just before forming for example, a sewing-machine line, and you may constitute so that a locating hole and a sewing-machine line may be formed simultaneously.

[0011] A forming means by which this invention 2 forms a crevice (21) in a resin sheet (8) (2), A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3), A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4), A cut means to form a sewing-machine line (32aand32b) in between the above-mentioned crevices (21 --) of this original fabric sheet (15) crosswise [of an original fabric sheet (15) / the feed direction and crosswise], respectively (5), It has the punched-out means (6) which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15). Prepare a star punched-out means (26) in the above-mentioned cut means (5), and the 4 ****-like star section (28) is constituted possible [blanking] in the intersection of both the above-mentioned sewing-machines line (32aand32b). It is characterized by having established a punching means (25) to form a locating hole (27) in the above-mentioned original fabric sheet (15), and constituting the intersection and the star section (28) of both the above-mentioned sewing-

machines line (32a and 32b) possible [alignment] with this locating hole (27).

[0012] The punching means said to the above-mentioned this invention 1 and this invention 2 does not need to add a new process compared with the case where may prepare in a cut means and it prepares in other parts, such as parts intermedia of for example, a closure means and a cut means, in this case, a facility does not enlarge it, but since the reconstruction from an existing facility is also easy again, it is more desirable. In addition, although the locating hole by the above-mentioned punching means may be formed in which part of an original fabric sheet, it is desirable to form in the garbage of the remainder with which blister packing of the predetermined configurations near the side edge etc. was pierced, for example.

[0013] Moreover, a forming means by which this invention 3 forms a crevice (21) in a resin sheet (8) (2), A packaging-goods-ed restoration means to supply and hold packaging goods-ed (22) in this crevice (21) (3), A closure means to form a seal sheet (14) in the state of closing opening of this crevice (21) at a lamination ***** sheet (15) (4), A cut means to form a sewing-machine line (32) between the above-mentioned crevices (21 --) of this original fabric sheet (15) (5), It has the punched-out means (6) which pierces blister packing (9) of a predetermined configuration from an original fabric sheet (15). Prepare a star punched-out means (26) in the above-mentioned cut means (5), and the 4 ** - like star section (28) is constituted possible [blanking] on the above-mentioned original fabric sheet (15). It is characterized by having arranged the sewing-machine edge (23) which forms this star punched-out means (26) and the above-mentioned sewing-machine line (32) in the shape of a serial, and constituting it possible [simultaneous formation of this sewing-machine line (32) and the above-mentioned star section (28)].

[0014]

[Function] In this invention 1, since a sewing-machine line is formed in the predetermined position to a locating hole and an original fabric sheet is positioned in the predetermined position of a punched-out means using this locating hole, the relative position of the appearance of the blister packing pierced with a punched-out means and the sewing-machine line formed with the cut means does not have involvement in the dimensional accuracy of an original fabric sheet, and is precisely positioned through the above-mentioned locating hole.

[0015] In this invention 2, the relative position of the star section by the star punched-out means and the sewing-machine line by the cut means does not have involvement in the dimensional accuracy of an original fabric sheet, and is precisely positioned through the locating hole formed with the punching means.

[0016] In this invention 3, since simultaneous formation of the star section is carried out at the shape of a sewing-machine line and a serial, this sewing-machine line and the star section do not produce a position gap. In addition, the above-mentioned sewing-machine line may be which sewing-machine line of the feed direction of an original fabric sheet, and the cross direction. Although it may be positioned to the sewing-machine line of the feed direction of an original fabric sheet, for example using the side edge section of an original fabric sheet etc. to the shape of the star section and a serial when carrying out simultaneous formation of the sewing-machine line of this cross direction, it is more desirable when using the locating hole of the above-mentioned this invention 1 or this invention 2 positions with high precision.

[0017] as the star punched-out means in the above-mentioned this invention 2 or this invention 3 -- star punched-out -- it can constitute from star punch which counters metal mold and this and is arranged general -- punched-out -- the punched-out means which consists of metal mold and punch -- punched-out -- the upper surface of metal mold -- the sheet for processing -- fixing -- punched-out [this] -- a predetermined configuration is pierced by carrying out the attitude drive of the punch towards metal mold

[0018] On the other hand, in order to stick a seal sheet on the upper surface of the resin sheet which held packaging goods-ed in the crevice and to form a sewing-machine line in this original fabric sheet, the original fabric sheet of blister packing needs to arrange a sewing-machine edge under the original fabric sheet in a cut means, and needs to make it go up and down this sewing-machine edge. Then, the star punched-out means prepared in the cut means in the above-mentioned this invention arranges the above-mentioned star punch by which an attitude drive is carried out under the original fabric sheet with a sewing-machine edge, and constituting a sewing-machine line and the star section respectively possible [formation] is also considered by carrying out the rise-and-fall drive of these. however, the star punched-out into which the piece of blanking is stuffed in this case -- since metal mold is located up, the piece of blanking tends to fall from metal mold, and the exclusion from equipment is difficult and -- if it does not lecture on suitable disposal, such as carrying out suction exclusion of this piece of blanking certainly, -- this piece of blanking -- star punched-out -- it falls from metal mold, and is scattered about on an original fabric sheet and other equipments, and

there is a possibility of producing a defective or mixing in the blister packing used as a product, and there is also a possibility that various obstacles may be produced to equipment and operation may stop

[0019] It constitutes from metal mold and star punch. then -- from the punch which has placed the above-mentioned cut means in a fixed position in the above-mentioned this invention 2 or this invention 3 to the female mold which formed the sewing-machine edge in the upper surface, and its upper part -- constituting -- the above-mentioned star punched-out means -- star punched-out -- this star punched-out -- while fixing metal mold to the upper surface of the above-mentioned female mold -- this star punched-out -- by making metal mold counter, attaching the above-mentioned star punch to the above-mentioned punch, and making it go up and down the above-mentioned female mold the above-mentioned sewing-machine edge and star punched-out, when metal mold is moved and a sewing-machine line and the star section are constituted possible [formation] in the predetermined position of the aforementioned original fabric sheet the star punched-out in which the piece of blanking produced on the occasion of formation of the star section in forming a sewing-machine line and the star section only by moving female mold is located below -- since it is pushed in metal mold -- this star punched-out -- metal mold -- it is certainly eliminated through inside

[0020]

[The form of operation] Hereafter, the form of operation of this invention is explained based on a drawing. Drawing 4 shows the 1st operation form of this invention from drawing 1 , and, for drawing 1 , the outline block diagram of a blister packaging machine and drawing 2 are [the perspective diagram of the female mold of a cut means and drawing 4 of the cross section of a cut means and drawing 3] explanatory drawings of the processing sequence of an original fabric sheet.

[0021] As shown in drawing 1 , this blister packaging machine (1) is equipped with a packaging-goods-ed [forming means (2)] restoration means (3), a closure means (4), a cut means (5), and a punched-out means (6), and it constitutes them so that the resin sheet (8) supplied from a resin sheet supply roll (7) may be passed in order and blister packing (9) of a predetermined configuration may be obtained. That is, after the resin sheet (8) supplied from a resin sheet supply roll (7) passing a heating unit (10), preheating it and forming the crevice of a predetermined configuration with the above-mentioned forming means (2), the tablet which is packaging goods-ed is supplied and held in this crevice from a hopper (12) with a packaging-goods-ed restoration means (3). Subsequently, the seal sheet (14) supplied from a seal sheet supply roll (13) is stuck on the above-mentioned resin sheet (8) with the above-mentioned closure means (4), opening of the above-mentioned crevice is closed, and a tablet is sealed. While this original fabric sheet (15) that stuck and was formed from ***** is guided to the above-mentioned punched-out means (6) after a predetermined sewing-machine line is formed between the above-mentioned crevices when passing the above-mentioned cut means (5), and a sign predetermined with a stamp means (16) etc. is stamped, and blister packing (9) of a predetermined configuration is pierced, the garbage of the remainder is discarded into a waste hold container (17).

[0022] As shown in drawing 2 , the above-mentioned cut means (5) is constituted in the passing <a thing> on processing type which consists of three processes of the punched-out section (18), the feed-direction sewing-machine line formation section (19), and the crosswise sewing-machine line formation section (20). The original fabric sheet (15) which passes the above-mentioned cut means (5) Since a tablet (22) is held in the crevice (21) formed in the resin sheet (8), and a seal sheet (14) is arranged to the upper part and it has sealed to it The sewing-machine edge (23) which forms a sewing-machine line from this resin sheet (8) side is formed in the female mold (5a) of a cut means (5), and constitutes this sewing-machine edge (23) from press equipment (24) possible [rise and fall].

[0023] the above-mentioned punched-out section (18) -- round shape punched-out -- the punching means (25) which consists of metal mold (25a) and a hollow punch (25b), and star punched-out -- the star punched-out means (26) which consists of metal mold (26a) and star punch (26b) is established in the shape of a serial it is shown in drawing 2 and drawing 3 -- as -- both the above-mentioned ***** -- metal mold (25aand26a) it was generated by blanking operation -- piercing -- a piece -- each punched-out one -- metal mold (25aand26a) -- so that it may fall and inside can be discarded certainly the above-mentioned female mold (5a) located caudad -- preparing -- **** -- each punched-out one -- metal mold (25aand26a) is made to counter, respectively, and a hollow punch (25b) and star punch (26b) are fixed to the punch (5b) of a cut means (5) in addition, the case where the piece of blanking can be certainly eliminated by vacuum suction etc. -- punched-out -- metal mold may be formed in the above-mentioned punch, and it may replace with these, and you may arrange possible [horizontal displacement]

[0024] as mentioned above, both the punched-out one prepared in this female mold (5a) since the female mold (5a) which formed the above-mentioned sewing-machine edge (23) was constituted possible [rise and fall] -- both the

above-mentioned blanking operation is performed by going up and down metal mold (25a and 26a) with female mold (5a) namely, -- if the above-mentioned female mold (5a) goes up -- an original fabric sheet (15) -- each punched-out one -- it is pushed with metal mold (25a and 26a), and is pinched between the blocks (34) arranged around each punch (25b and 26b) of a punch (5b) further -- female mold (5a) and each punched-out, if metal mold (25a and 26a) goes up The above-mentioned block (34) retreats upwards, being buffered by the buffer member made of rubber (30). As the nose of cam of the above-mentioned hollow punch (25b) which penetrates this block (34), and star punch (26b) is forced on the predetermined part of the above-mentioned original fabric sheet (15) and it is shown in drawing 4 while the locating hole (27-27) of a couple is pierced near the edges on both sides of an original fabric sheet (15) -- between both locating holes (27-27) -- and the star section (28 --) of the shape of four 4 **** is pierced in the middle of each crevice (21) in which the tablet (22) was held and it was generated by this blanking operation -- it pierces, vacuum suction of the piece is carried out, and it is shown in drawing 2 -- as -- punched-out -- metal mold (25a and 26a) -- it is discharged from inner exhaust passage (29) In addition, although the rubber cylinder is used with this operation gestalt as the above-mentioned buffer member (30), it may replace with this and a metal spring etc. may be used.

[0025] Subsequently, while female mold (5a) descends and going up again, the portion in which only the predetermined size was sent and the original fabric sheet (15) formed the above-mentioned locating hole (27) and the star section (28) is sent into the feed-direction sewing-machine line formation section (19). And after the nose of cam of a pilot pin (31) is first inserted in the above-mentioned locating hole (27) with elevation of female mold (5a) and an original fabric sheet (15) is positioned by this in a predetermined position, the sewing-machine line (32a) of a feed direction is formed with the sewing-machine edge (23a) of four sheets. And the same operation is repeated and a crosswise sewing-machine line (32b) is formed in the predetermined part of an original fabric sheet (15) with a crosswise sewing-machine edge (23b). Since an original fabric sheet (15) is positioned using a locating hole (27) at this time, the intersection of both the above-mentioned sewing-machines line (32a and 32b) is positioned precisely in the position in which the aforementioned star section (28) was formed.

[0026] The original fabric sheet (15) which passed the above-mentioned cut means (5) when it feeds into the above-mentioned punched-out means (6), it is shown in drawing 4 -- as -- punched-out -- so that the heights (33) prepared in the periphery of metal mold (6a) may be precisely located in the edge of the sewing-machine line (32) formed with the above-mentioned cut means (5) It is positioned using the above-mentioned locating hole (27), and blister packing (9) of a predetermined configuration is pierced.

[0027] Although the crosswise sewing-machine line (32b) was formed with the above-mentioned 1st operation gestalt after forming a sewing-machine line (32a) in the feed direction of an original fabric sheet (15), you may form which sewing-machine line first. Moreover, although the punching means (25) and the star punched-out means (26) were prepared in the punched-out section (18), after forming this in two stages and forming a locating hole with a punching means, you may constitute so that the star section may be formed with a star punched-out means. In this case, after forming a locating hole, you may form the star section and each sewing-machine line in what sequence.

[0028] Explanatory drawing of the processing sequence of an original fabric sheet and drawing 7 of the perspective diagram of a crosswise sewing-machine edge which drawing 7 showed the 2nd operation gestalt of this invention from drawing 5 , and prepared drawing 5 in the cut means, and drawing 6 are the fragmentary sectional views of a cut means.

[0029] this 2nd operation gestalt shows to drawing 5 -- as -- the star punched-out of the sewing-machine edge (23b) of the cross direction of an original fabric sheet, and a star punched-out means (26), as metal mold (26a) is arranged in the shape of a serial and it is shown in drawing 6 With a cut means (5), a locating hole (27) is formed first, subsequently the sewing-machine line (32a) of a feed direction is formed, and, finally the star section (28) is simultaneously formed in the intersection of a crosswise sewing-machine line (32b) and both the sewing-machines line (32a and 32b).

[0030] That is, as shown in drawing 7 , the above-mentioned sewing-machine edge (23b) is made to counter the punch (5b) of a cut means (5), the block (34) is arranged, star punch (26b) is arranged possible [penetration of this block (34)], and the plunger (35) driven with the driving gear outside drawing constitutes possible [press] to the lower part through the inclination cam die (36). In addition, the shock-absorbing-rubber cylinder for a sign (37) pushing back star punch (26b) upwards and a sign (38) show the buffer member for buffering the shock to which a sewing-machine edge (23b) runs against a block (34).

[0031] If the female mold (5a) of a cut means (5) goes up, after inserting the nose of cam of a pilot pin (31) in the locating hole of an original fabric sheet (15) first and positioning an original fabric sheet (15) in a predetermined

position, a sewing-machine edge (23b) is pushed and a crosswise sewing-machine line is formed. in addition, the above-mentioned star punched-out -- metal mold (26a) -- the edge of a blade of a sewing-machine edge (23b) -- an original fabric sheet (15) -- enough -- pile **** -- the upper limit is slightly formed low rather than this edge of a blade like The above-mentioned plunger (35) drives below almost simultaneously with formation of this sewing-machine line, star punch (26b) descends, an original fabric sheet (15) is pierced, and the star section is formed. and the piece of blanking -- star punched-out -- metal mold (26a) -- inside is fallen and attracted and it is discharged from exhaust passage (29) Other composition is the same as that of the above-mentioned 1st operation gestalt, and omits explanation.

[0032] Although the sewing-machine line of a feed direction was formed with the above-mentioned 2nd operation gestalt after forming a locating hole, both may be formed simultaneously and it can be made the passing <a thing> on processing type which consists of two processes in this case. Moreover, you may arrange a star punched-out means the shape of a sewing-machine edge and a serial which forms the sewing-machine line of a feed direction. Moreover, after forming simultaneously a sewing-machine line, the crosswise star section, and a crosswise locating hole, you may form the sewing-machine line of a feed direction. In addition, if the alignment of the cross direction of an original fabric sheet takes only a cut means into consideration when forming simultaneously a crosswise sewing-machine line and the crosswise star section since the side edge section of a sheet can also be used, it can also omit the above-mentioned locating hole.

[0033] Although the above-mentioned operation gestalt explained the case where a circular corner was formed in the piece of separation of blister packing by each, if the star section of this invention is not sharp, they may be other configurations. For example, the star section (28) is formed in a rhombus in the 1st modification shown in drawing 8 . In this case, although the corner of the piece of separation (39) of blister packing (9) is square, it does not serve as the configuration where it sharpened compared with the case where it becomes right-angled [the former].

[0034] Moreover, although the above-mentioned operation gestalt explained the case where the blister packing (9) which all consists only of a piece of separation (39) was manufactured, the blister packaging machine of this invention cannot be overemphasized by that it is applicable to the blister packing (9) which has a handle part (40) in the edge like the 2nd modification shown in drawing 9 .

[0035] In addition, including a cut means, although a punching means to form a locating hole was prepared in the cut means with the above-mentioned operation gestalt, as long as it is an upstream, you may prepare in which position rather than this. Moreover, although the above-mentioned operation gestalt explained the case where a tablet was packed, the packaging goods-ed which can be packed by the blister packaging machine of this invention cannot be overemphasized by that you may be packaging goods-ed of other configurations, such as a capsule, and packaging goods-ed other than a drug.

[0036]

[Effect of the Invention] Since this invention is constituted as mentioned above and acts, it does the following effect so.

[0037] (b) The relative position of the sewing-machine line formed with the cut means in this invention 1 through the locating hole which a punching means forms, and the appearance of the blister packing pierced with a punched-out means Since it is positioned precisely without relation to the dimensional accuracy of an original fabric sheet, the kurtosis of the corner of the piece of separation separated separately can be lost simply and certainly by doubling precisely the position of the edge of the above-mentioned sewing-machine line, and the notch formed in the periphery of blister packing. For this reason, even if there is intake-by-mistake accident, there will be no possibility of damaging an esophagus and a stomach by the piece of separation, and even if it treats the piece of separation coarsely, there is no possibility of damaging a fingertip etc.

[0038] (b) In this invention 2, through the locating hole formed with the punching means, the relative position of the star section by the star punched-out means and the sewing-machine line by the cut means can be positioned precisely without relation to the dimensional accuracy of an original fabric sheet, and the kurtosis of the corner of the piece of separation separated separately can be lost simply and certainly. For this reason, even if there is intake-by-mistake accident, there will be no possibility of damaging an esophagus and a stomach by the piece of separation, and even if it treats the piece of separation coarsely, there is no possibility of damaging a fingertip etc. And it is not necessary to add the new process for forming the star section, since the star punched-out means is prepared in the cut means, and since a facility is not enlarged but it can convert easily from an existing facility again, it can carry out cheaply.

[0039] (c) When a punching means is prepared in a cut means in the above-mentioned this invention 1 or this invention 2, it is not necessary to add the new process for forming a locating hole compared with the case where it prepares in the pars intermedia of a closure means and a cut means, and a facility is not enlarged, but since the reconstruction from an existing facility is also easy again, it can carry out still more cheaply.

[0040] (d) In this invention 3, since simultaneous formation of the star section is carried out at the shape of a sewing-machine line and a serial, this sewing-machine line and the star section do not have a possibility of producing a position gap, and can lose much more certainly the kurtosis of the corner of the piece of separation separated separately. And since the star punched-out means is arranged a sewing-machine edge and in the shape of a serial, in being able to establish a star punched-out means, without enlarging a cut means, from an existing facility, it can convert easily and can carry out cheaply.

[0041] (e) Constitute from metal mold and star punch. from the punch which has placed the cut means in a fixed position in this invention 2 or this invention 3 to the female mold which formed the sewing-machine edge in the upper surface, and its upper part -- constituting -- the above-mentioned star punched-out means -- star punched-out -- this star punched-out -- while fixing metal mold to the upper surface of the above-mentioned female mold -- this star punched-out -- by making metal mold counter, attaching the above-mentioned star punch to the above-mentioned punch, and making it go up and down the above-mentioned female mold the above-mentioned sewing-machine edge and star punched-out, when metal mold is moved and a sewing-machine line and the star section are constituted possible [formation] in the predetermined position of the aforementioned original fabric sheet In the ability forming a sewing-machine line and the star section easily only with the composition to which female mold is moved, the star punched-out caudad located in the piece of blanking produced on the occasion of formation of the star section -- metal mold -- it can eliminate certainly through inside, and the pieces of blanking are scattered about on an original fabric sheet and other equipments, and there is no possibility of producing a defective or mixing in the blister packing from which it becomes a product

[Translation done.]